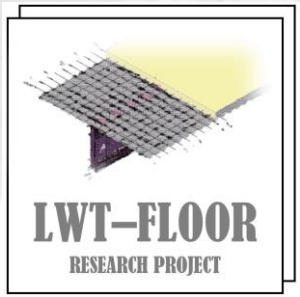
Opening Session - presentation of the LWT FLOOR project and overview of the realised activities

Ivan Lukačević



1. Introduction

1. Introduction

Projekt LWT-FLOOR povezuje najnovije spoznaje u novoj, brzoj i produktivnoj tehnologiji točkastog zavarivanja i inovativna rješenja sprezanja hladno oblikovanog čelika i betona predlažući novu metodu izgradnje kao kombinaciju sastavljenih hladno oblikovanih čeličnih elemenata i betonske ploče. Ovaj ekonomičan i održiv sustav lagane međukatne konstrukcije nudi vitalne prednosti u smislu visokog stupnja predgotovljenosti, mogućnosti ponovne upotrebe i mogućih velikih raspona. Glavni cilj projekta je uspostaviti novu istraživačku grupu koja će posjedovati znanje i opremu za istraživanje novog sustava međukatne konstrukcije s fokusiranim znanstvenim interesima u potrazi za konkurentnijim nacionalnim i međunarodnim financiranjem. Kako bi se istražile i vrednovale komponente i sustav u cjelini, planira se opsežno eksperimentalno, numeričko i probabilističko istraživanje. U okviru istraživanja posebna pozornost će biti posvećena točkastim zavarima i inovativnim vrstama posmične veze s mogućnošću projektiranja za demontažu i potencijalom za buduće ponovne uporabe ili recikliranja na kraju životnog vijeka uključujući analize životnog ciklusa. Kalibrirani numerički modeli temeljeni na eksperimentalnim ispitivanjima sustava i njegovih komponenata omogućit će, uz primjenu probabilističkih metoda, procjenu prikladnosti sustava za veće raspone. Projekt će donijeti nove vještine istraživačkoj grupi i istraživačkoj instituciji, a pored toga obranit će se i dvije disertacije te objaviti znanstveni radovi u najcitiranijim časopisima. Ovaj inovativni projekt, koji osigurava čvrste veze između akademske zajednice i industrije, povećat će mobilnost i ojačati dugoročnu suradnju između dva sektora. Probabilističke analize i procjene ponašanja predloženog rješenja u životnom ciklusu međukatne konstrukcije bit će od ključnog značaja za pripremu prvog analitičkog prijedloga za izradu preporuka za projektiranje ovog novog sustava u okviru europskih norma.

The LWT-FLOOR project integrates state-of-the-art knowledge in new, fast and productive spot-welding technology and innovative cold-formed steel-concrete composite solutions proposing a new construction method as a combination of built-up cold-formed steel members and cast-in-place concrete slab. This cost-effective and sustainable floor system offers vital benefits in terms of a high degree of prefabrication, reusability and long spanning capability. The main objective of the project is to establish a new research group that will possess knowledge and equipment for research on new composite floor system with focused scientific interests in a search for more competitive national and international funding. In order to investigate and validate components and proposed system, the extensive experimental, numerical and probabilistic research is planned. Within research, a particular focus will be given to spot-welding connections and innovative types of shear connections with possibility of design for demountability and the potential of re-use or recycling at the end of design life through the application of lifecycle analyses. Calibrated and validated numerical models based on experimental tests of the system and its components will allow, through the application of probabilistic methods, evaluation of the system suitability for larger spans. The project will bring out new skills to the research group and the research institution, besides which two dissertations will be defended and scientific papers in most cited journals will be published. This innovative project, providing strong connections between the scientific community and industry, will increase the mobility as well as strengthen long-term cooperation between the two sectors. Probabilistic analyses and life cycle performance evaluation of the proposed floor system solution will be crucial for establishing the first analytical proposal for design recommendations of this new system within the European standards.

PROGRAM // PROGRAMME

Soba 219, 2. kat glavna zgrada //Room 219, 2nd floor main building

09h45 – 10h00	REGISTRACIJA // REGISTRATION
10h00 – 10h20	Ivan Lukačević **Otvaranje radionice –prezentacija LWT-FLOOR projekta i pregled realiziranih aktivnosti** Opening Session – presentation of the LWT-FLOOR project and overview to the realised activities
10h20 – 10h40	Ivan Lukačević, Ivan Ćurković, Andrea Rajić, Vlaho Žuvelek **Projektiranje i izrada uzoraka materijala, točkastih zavara i posmičnih veza** Design and fabrication of material, spot welded and push-out specimens
10h40 – 11h00	Ivan Lukačević, Ivan Ćurković, Marko Bartolac, Andrea Rajić, Vlaho Žuvelek **Provedba laboratorijskih ispitivanja i analiza rezultata – osnovni materijal te točkasti zavari** Implementation and analyses of laboratory tests – base material & spot welds
11h00 – 11h30	STANKA // BREAK
11h30 – 11h50	Ivan Ćurković, Ivan Lukačević, Marko Bartolac, Vlaho Žuvelek, Andrea Rajić **Provedba i analiza push-out testa posmične veze kod spregnutih nosača izvedenih od hladno oblikovanih čeličnih profila i betona** Implementation and analysis of the push-out test on shear connectors in composite beams cold-formed steel profiles-concrete
11h50 – 12h10	Ivan Lukačević, Ivan Ćurković, Andrea Rajić, Vlaho Žuvelek **Parametarske analize laganih spregnutih nosača hladno oblikovani čelik-beton** Parametric finite element analyses of lightweight cold-formed steel-concrete composite floor beams
12h10 – 12h30	Ivan Ćurković, Ivan Lukačević, Vlaho Žuvelek, Andrea Rajić **Numeričko ispitivanje posmične veze kod spregnutih nosača od hladno oblikovanog čelika i betona** Numerical investigation of shear connection in cold-formed steel-concrete composite beam
12h30 – 13h00	STANKA // BREAK
13h00 – 13h20	Andrea Rajić, Ivan Lukačević, Ivan Ćurković, Vlaho Žuvelek **Numerička analiza spregnutog međukatnog sustava hladno oblikovani čelik-beton s demontažnim posmičnim sredstvima** Numerical study of cold-formed steel-concrete composite floor system with demountable shear connectors
13h20 –13h40	Vlaho Žuvelek, Ivan Ćurković, Ivan Lukačević, Andrea Rajić **Numerička analiza ponašanja posmične veze između čelika i betona kod spregnutih nosača izvedenih od hladno oblikovanih profila** Numerical study of the behaviour of the bolted shear connection in cold-formed steel-concrete comp
13h40 – 14h00	Ivan Lukačević, Daniel Viorel Ungureanu **Numerička parametarska studija sastavljenih nosača s valovitim hrptom na zglobnim osloncima** Numerical parametric study on corrugated web built- up beams with pinned end supports
14h00 – 14h10	ZATVARANJE RADIONICE // CLOSING OF WORKSHOP

https://www.grad.unizg.hr/lwtfloor

https://www.grad.unizg.hr/lwtfloor

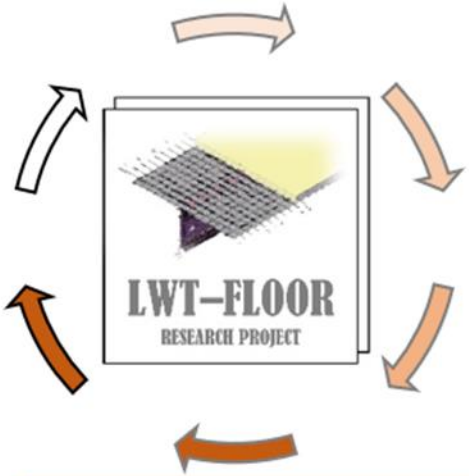
1. Introduction

O1 …to establish research group

ER1: Research group equipped with knowledge and instrumentation for specimen's preparation, experimental, numerical and probabilistic testing, understanding components and overall behaviour of the proposed system through the entire life cycle.

O2 …to investigate and validate, experimentally, numerically and probabilistically components of proposed system

ER2: Technical report with test results on materials and optimal welded and shear connections solutions.



O3 …to investigate and validate, experimentally, numerically and probabilistically proposed system

ER3: Technical report with results for the proposed system

O4 …to validate proposed floor system through on numerical parametric studies, probabilistic methods and life cycle analyses

ER4: Report with validation of FE models for different floor system typologies and results of numerical, probabilistic and life cycle studies of specimens with larger spans.

O5 …to establish an analytical proposal for design recommendations for this new type of floor system

ER5: Technical recommendations for design and fabrication will be proposed

O6 …to prepare project proposals and applying to other sources of funding

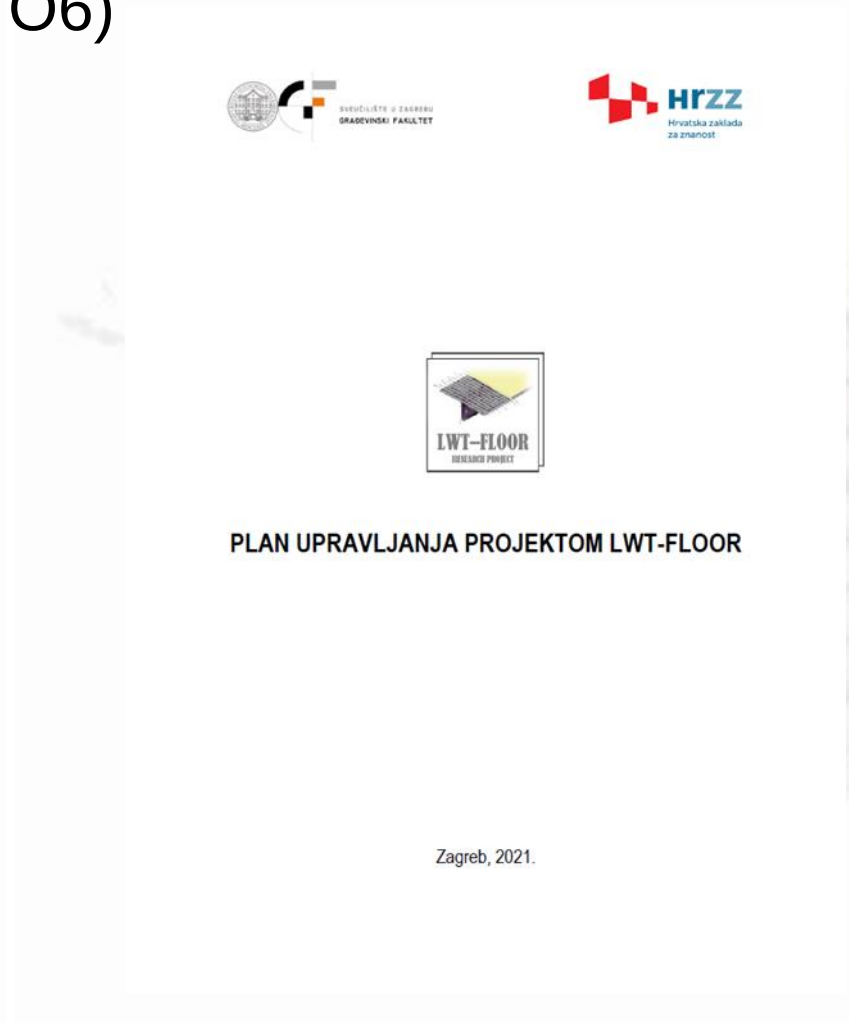
ER6: Research group as a centre of expertise self-sustained through other national and international funding sources.

2. Realised activities 1st year

1st Project Period	
Results to be achieved	RG member
D1. Defined project implementation management plan (O1 to O6) – finnished	IL
D2. Project Kickoff Meeting: Electronic data exchange facilities will be organized for communication data sharing (O1 to O6) – finnished	All
D3. Project webpage installation, profile of the project on the Academic Social Network Site and visual identity of the project (O1 to O6) – finnished	IL
D4. Presentation of project on the web site (O1 to O6) – continuous job...	IL, PhD Student (D)
D5. Literature delivered (O2 to O5) – finnished	IL
D6. PhD student employed; research group established (O1) – planed July 2021, realised Nov 2021	All
D7. 1st Research group coordination meeting (O1 to O6) - finnished	All
D8. Training for PhD student – Cold-formed steel (O2 to O5) – not realised due to delay of D6.	D
D9. Training for PhD student – Composite structures (O2 to O5) - not realised due to delay of D6.	D
D10. Design of specimens for testing and technical specification for fabrication (O2, O3) –finished	IL, D, MB, IĆ, IČ
D11. Fabrication of material specimens (O2) – finnished	IL, D, MB, IĆ, IČ
D12. Fabrication of spot-welded connections (O2) - finnished	IL, D, MB, IĆ, IČ
D13. Fabrication of shear connections (O2) - finnished	IL, D, MB, IĆ, IČ
D14. Presentation of the project results one or two papers (ICMS'21) and one or two papers (IABSE 2021) (O2) – EUROSTEEL 2021, WMCAUS 2021, IC-UBT 2021, LIMAS 2021	IL, D, IĆ, IČ, IČ
D15. Journal Paper SCOPUS WoS Q3, Q4 – state of the art paper (O2, O3) – finnished	IL, D, MB, IĆ, IČ
D16. 1st Workshop organised (O1 to O2) – finnished (17th of December 2021)	All

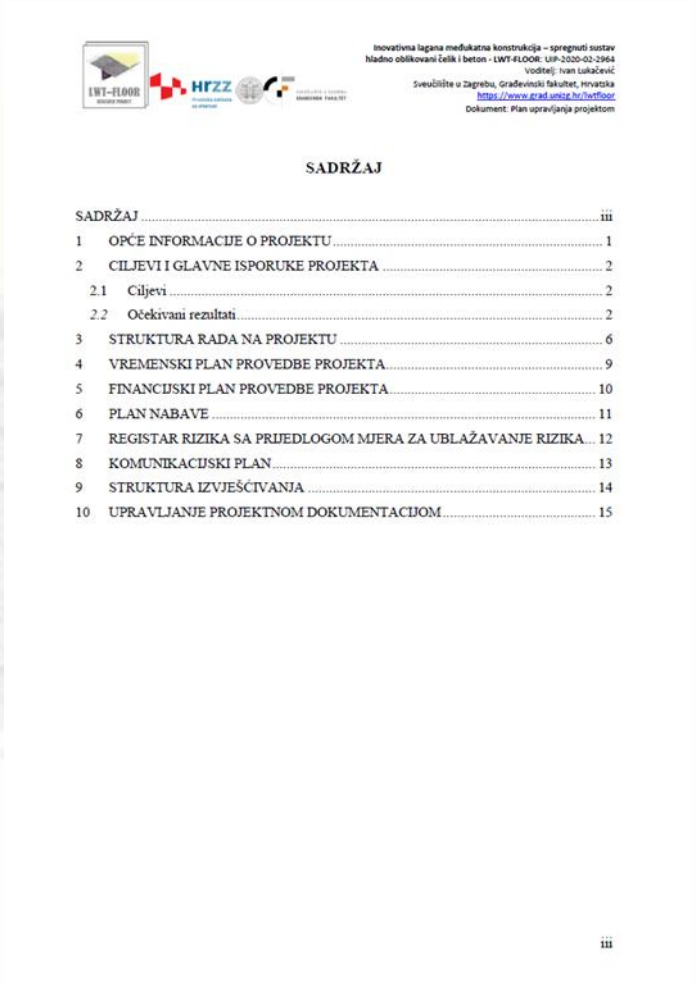
2. Realised activities 1st year

- D1. Defined project implementation management plan (O1 to O6)



PLAN UPRAVLJANJA PROJEKTOM LWT-FLOOR

Zagreb, 2021.



Inovativna lagana međukatna konstrukcija – spregnuti sustav hladno oblikovani čelik i beton - LWT-FLOOR; UIP-2020-02-2964
Voditelj: Ivan Lukačević
Sveučilište u Zagrebu, Građevinski fakultet, Hrvatska
https://www.grad.unizg.hr/lwtfloor
Dokument: Plan upravljanja projektom

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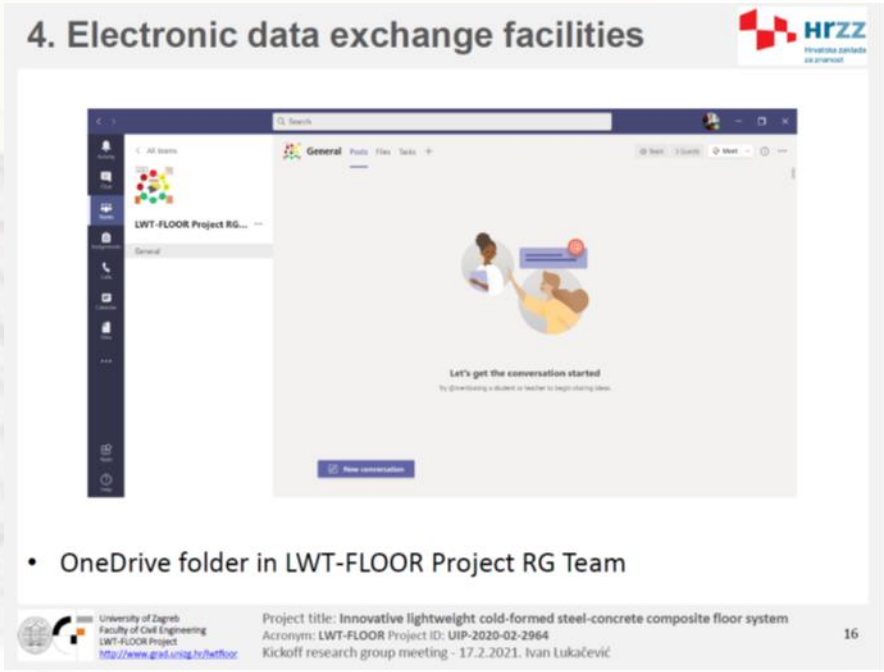
iii

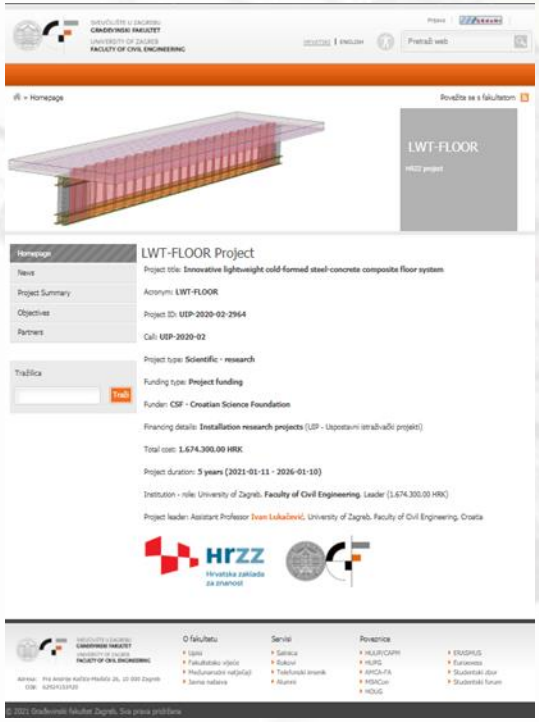
2. Realised activities 1st year

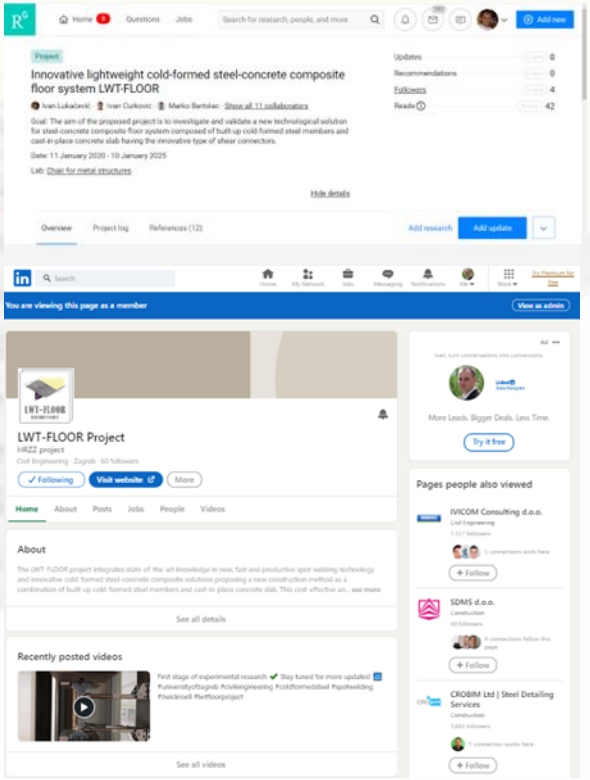
- D2. Project Kickoff Meeting: Electronic data exchange facilities will be organized for communication data sharing



2. Realised activities 1st year

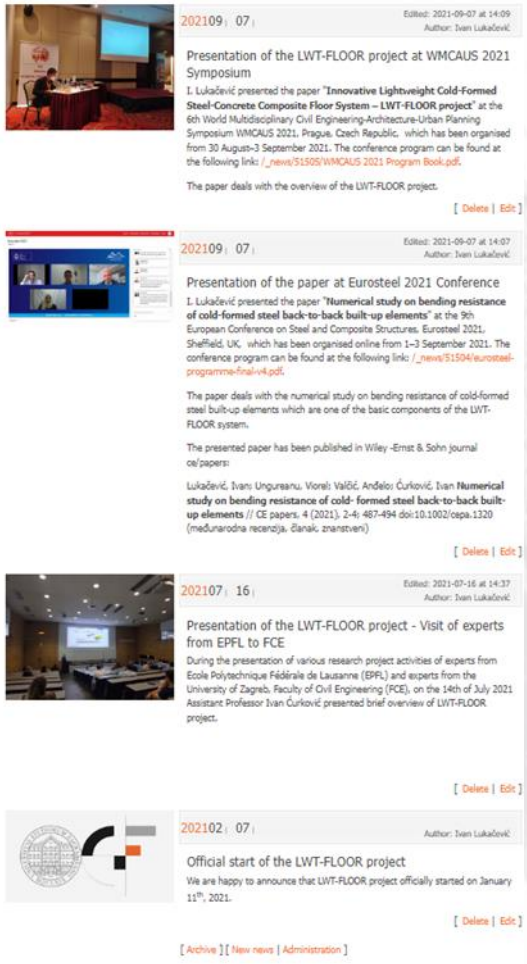
- D3. Project webpage installation, profile of the project on the Academic Social Network Site and visual identity of the project (O1 to O6)





2. Realised activities 1st year

- D4. Presentation of project on the web site (O1 to O6)



202109 | 07 | Edited: 2021-09-07 at 14:09 Author: Ivan Lukačević

Presentation of the LWT-FLOOR project at WMCAUS 2021 Symposium

I. Lukačević presented the paper "**Innovative Lightweight Cold-Formed Steel-Concrete Composite Floor System – LWT-FLOOR project**" at the 6th World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium WMCAUS 2021, Prague, Czech Republic, which has been organised from 30 August–3 September 2021. The conference program can be found at the following links: /_news/51505/WMCAUS 2021 Program Book.pdf.

The paper deals with the overview of the LWT-FLOOR project.

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202109 | 07 | Edited: 2021-09-07 at 14:07 Author: Ivan Lukačević

Presentation of the paper at Eurosteel 2021 Conference

I. Lukačević presented the paper "**Numerical study on bending resistance of cold-formed steel back-to-back built-up elements**" at the 9th European Conference on Steel and Composite Structures, Eurosteel 2021, Sheffield, UK, which has been organised online from 1–3 September 2021. The conference program can be found at the following links: /_news/51504/eurosteel-programme-final-v4.pdf.

The paper deals with the numerical study on bending resistance of cold-formed steel built-up elements which are one of the basic components of the LWT-FLOOR system.

The presented paper has been published in Wiley -Ernst & Sohn journal ce/papers:

Lukačević, Ivan; Ungureanu, Viorel; Vaičić, Anđelo; Ćurković, Ivan **Numerical study on bending resistance of cold- formed steel back-to-back built-up elements** // CE papers. 4 (2021), 2-4; 487-494 doi:10.1002/cepa.1320 (međunarodna recenzija, članak, znanstveni)

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202107 | 16 | Edited: 2021-07-16 at 14:37 Author: Ivan Lukačević

Presentation of the LWT-FLOOR project - Visit of experts from EPFL to FCE

During the presentation of various research project activities of experts from École Polytechnique Fédérale de Lausanne (EPFL) and experts from the University of Zagreb, Faculty of Civil Engineering (FCE), on the 14th of July 2021 Assistant Professor Ivan Ćurković presented brief overview of LWT-FLOOR project.

[Delete | Edit]

202102 | 07 | Author: Ivan Lukačević

Official start of the LWT-FLOOR project

We are happy to announce that LWT-FLOOR project officially started on January 11th, 2021.

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[Archive] [New news | Administration]

202112 | 03 | Author: Ivan Lukačević

Presentation of the paper at 3rd International Conference on Lightweight Design of Engineering Structures – LIMAS 2021

I. Lukačević presented the paper "**Numerical Analysis of Lightweight Cold-Formed Steel-Concrete Composite Floor System**" at the 3rd International Conference on Lightweight Design of Engineering Structures – LIMAS 2021, Edinburgh, UK, which has been organised from 22-23 November 2021 online. The conference program can be found at the following links: https://asranet.co.uk/Conferences/LIMAS.

The paper deals with the overview of the LWT-FLOOR project and the results of preliminary numerical evaluations.

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202111 | 25 | Author: Ivan Lukačević

LWT-FLOOR project logo has been created!

LWT-FLOOR project logo has been created!

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202111 | 25 | Edited: 2021-11-25 at 08:48 Author: Ivan Lukačević

The LWT-FLOOR research group has been established!

The LWT-FLOOR research group has been established! From the 15th of November, a PhD student Andrea Rajić has been employed, and from the 22nd of November, she is officially a member of the LWT-FLOOR research group! Congratulations, Andrea Rajić!

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202111 | 19 | Edited: 2021-11-24 at 08:02 Author: Ivan Lukačević

Presentation of the paper at 10th International Conference on Business, Technology and Innovation 2021

A. Rajić presented the paper "**Behaviour of lightweight built-up cold-formed steel-concrete composite beam in bending**" at the 10th International Conference on Business, Technology and Innovation 2021 - sub conference 10th International Civil Engineering, Infrastructure and Environment Conference, Priština, Kosovo, which has been organised online from 29–30 October 2021. The abstract of the paper can be found at the following links: https://conferences.ubt-uni.net/2021/wp-content/uploads/2021/11/10th-International-Conference-on-Business-Technology-and-Innovat.pdf

The paper deals with the numerical study on bending resistance of built-up cold-formed steel-concrete composite beam.

The presented paper will be published in Conference procedings soon.

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202112 | 23 | Author: Ivan Lukačević

Merry Christmas and a happy and prosperous new year!

We wish you a Merry Christmas and a happy and prosperous new year!

LWT-FLOOR Project Research Group Members

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202112 | 23 | Edited: 2021-12-23 at 12:17 Author: Andrea Rajić

The first workshop of LWT-FLOOR project

On December 17th, the first LWT-FLOOR project workshop was held. We thank all the presenters and participants of the workshop.

The videos of workshop presentations and discussions will be published on the project web page soon.

[Delete | Edit]

202112 | 20 | Author: Andrea Rajić

The first research group meeting

On 3rd of December, the first online meeting of the research group was held, at which the achievements of the project so far were presented, as well as the plans for the continuation of the project implementation. The current members of the project were introduced to the newly employed doctoral students and their roles in the project activities.

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202112 | 20 | Edited: 2021-12-20 at 13:28 Author: Ivan Lukačević

New research group member!

PhD student Vlaho Žuvelek become officially a member of the LWT-FLOOR research group. Congratulations, Vlaho Žuvelek!

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202112 | 10 | Edited: 2021-12-10 at 21:39 Author: Ivan Lukačević

1st Workshop LWT-FLOOR Project

1st LWT-FLOOR Project WORKSHOP will be organised at the University of Zagreb, Faculty of Civil Engineering, Zagreb, Croatia on 17th of December 2021, Online. Aims of the workshop are the presentation of the LWT-FLOOR project background, presentations and discussions about planned activities and recent results and presentation of other activities of the research group members and project advisors related to the composite and cold-formed steel structural elements.

A workshop flyer with the programme is available HERE.

The link for the live event via MS Teams is available HERE.

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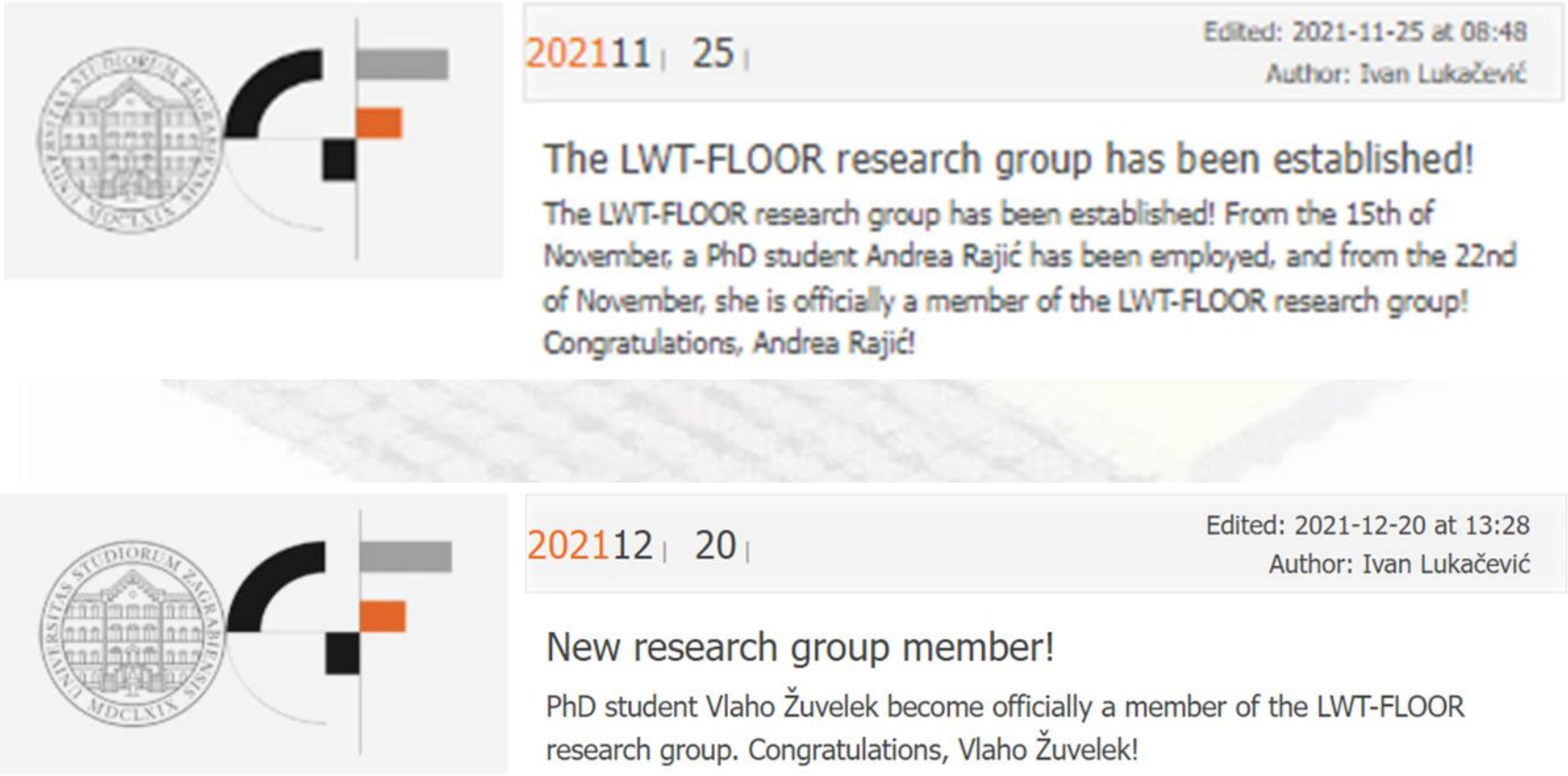
2. Realised activities 1st year

- D5. Literature delivered (O2 to O5)

2. Realised activities 1st year

- D6. PhD student employed; research group established (O1)



202111 | 25 |

Edited: 2021-11-25 at 08:48
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202112 | 20 |

Edited: 2021-12-20 at 13:28
Author: Ivan Lukačević

New research group member!

PhD student Vlaho Žuvelek become officially a member of the LWT-FLOOR research group. Congratulations, Vlaho Žuvelek!

2. Realised activities 1st year

- D7. 1st Research group coordination meeting (O1 to O6)

Project title: **Innovative lightweight cold-formed steel-concrete composite floor system**
Acronym: **LWT-FLOOR** Project ID: **UIP-2020-02-2964**
1st research group meeting – 3.12.2021.

LWT-FLOOR Project

Innovative lightweight cold-formed steel-concrete composite floor system

Ivan Lukačević

University of Zagreb/Faculty of Civil Engineering
http://www.grad.unizg.hr/lwtfloor

2. Realised activities 1st year

- D10. Design of specimens for testing and technical specification for fabrication (O2, O3)

PROJEKTIRANJE UZORAKA ZA ISPITIVANJE I TEHNIČKE SPECIFIKACIJE ZA IZRADU LWT-FLOOR

Zagreb, 2021.

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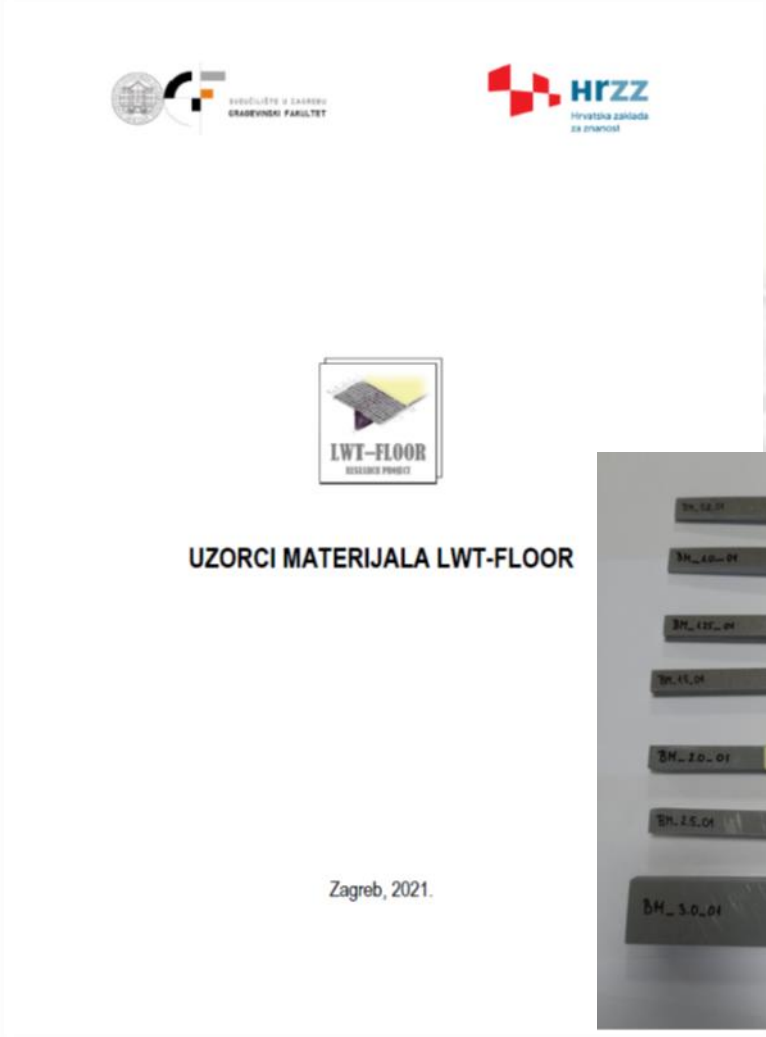
2. Realised activities 1st year

- D11. Fabrication of material specimens (O2)



UZORCI MATERIJALA LWT-FLOOR

Zagreb, 2021.

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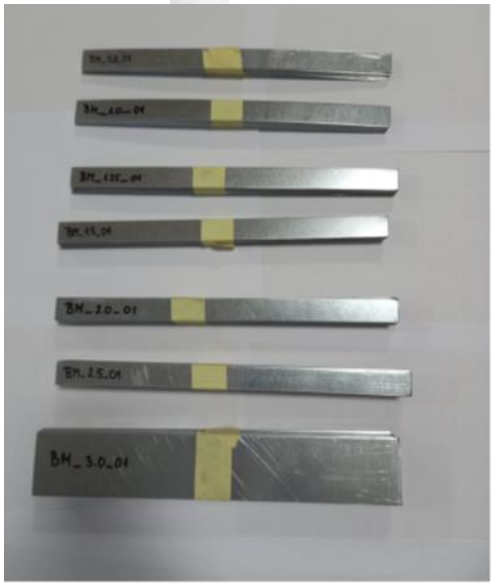
2.3 Vijci 12
2.4 Beton 13



2. Realised activities 1st year

- D12. Fabrication of spot-welded connections (O2)

SVEUČILIŠTE U ZAGREBU GRAĐEVINSKI FAKULTET

HRZZ Hrvatska zaklada za znanost

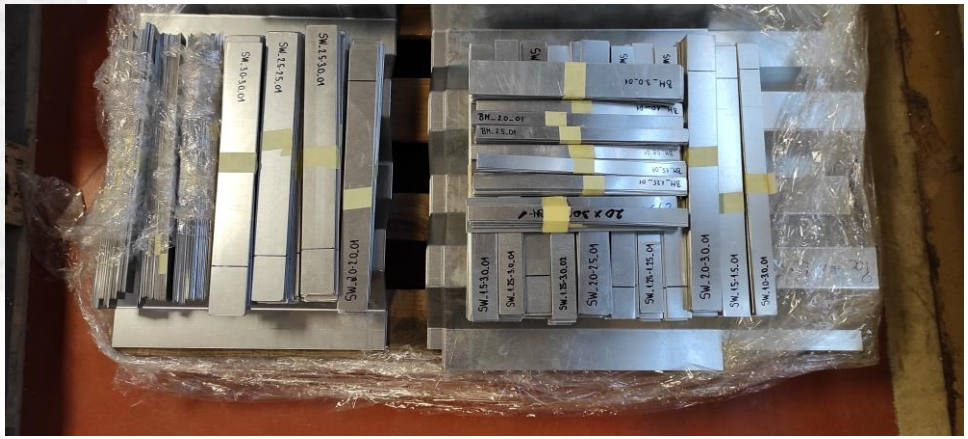
LWT–FLOOR RESEARCH PROJECT

UZORCI MATERIJALA LWT-FLOOR

Zagreb, 2021.

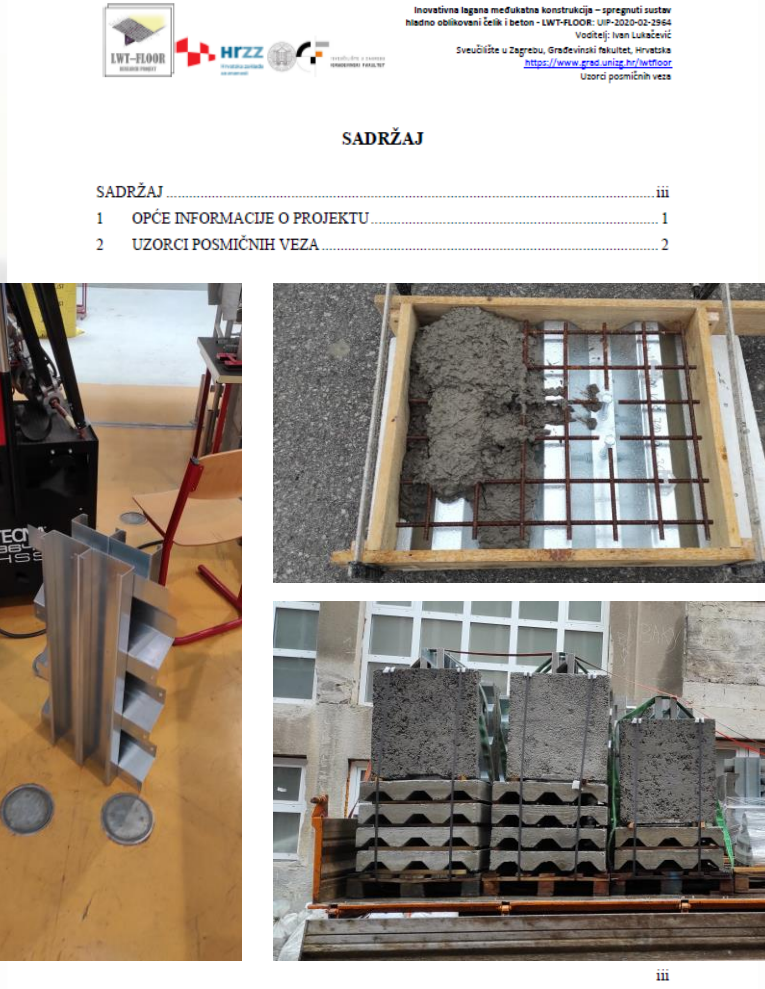
Inovativna lagana međukatna konstrukcija – spregnuti sustav hladno oblikovani čelik i beton - LWT-FLOOR: UIP-2020-02-2964
Voditelj: Ivan Lukačević
Sveučilište u Zagrebu, Građevinski fakultet, Hrvatska
https://www.grad.unizg.hr/lwtfloor
Uzorci točkastih zavara

SADRŽAJ



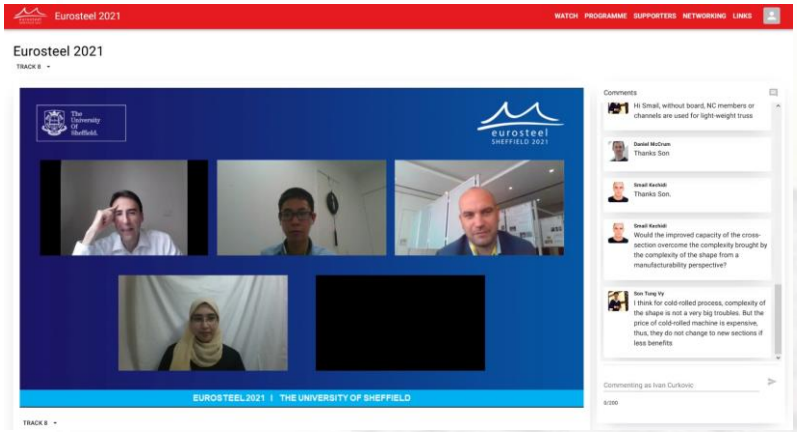
2. Realised activities 1st year

- D13. Fabrication of shear connections (O2)

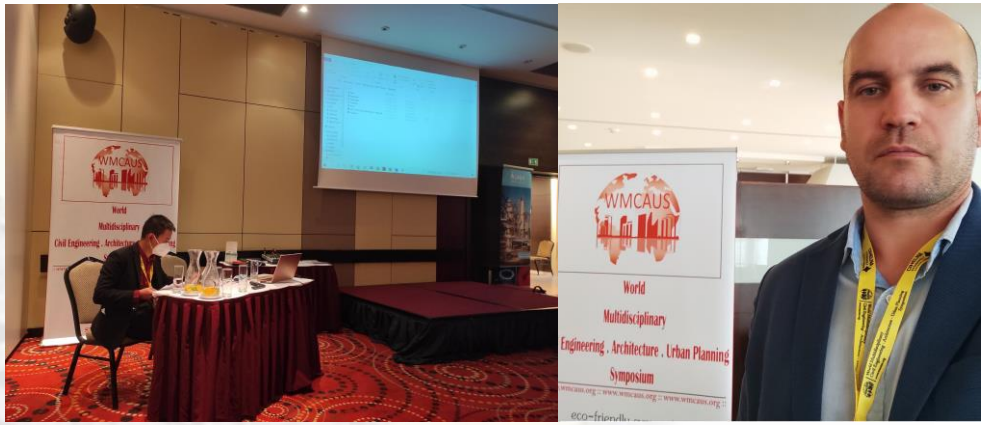


2. Realised activities 1st year

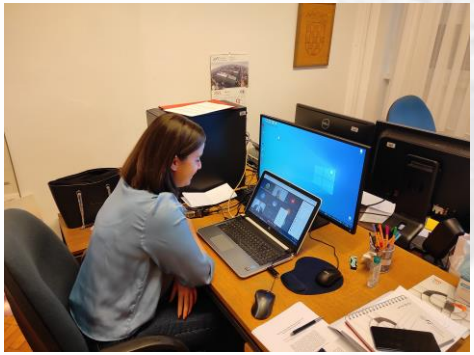
- D14. Presentation of the project results one or two papers (ICMS'21) and one or two papers (IABSE 2021) (O2)



EUROSTEEL 2021



WMCAUS 2021



IC-UBT 2021

LIMAS 2021

2. Realised activities 1st year

- D15. Journal Paper SCOPUS WoS Q3, Q4 – state of the art paper (O2, O3)

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Innovative Lightweight Cold-Formed Steel-Concrete Composite Floor System – LWT-FLOOR project

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Abstract

References

Abstract

To provide the foundations for economic and social prosperity, countries worldwide need to be making a term investment in their building assets. However, there is a lack of a systematic approach, such as manufacturing innovations, to maximize the values of building components and materials in its entire lifecycle. Steel-concrete composite floor systems are one of the most cost-effective construction systems for multi-storey steel buildings because they combine structural efficiency with the speed of construction. These advantages depend on the efficiency of combining steel and concrete structural elements to avoid their inherent disadvantages. This paper presents a solution that integrates state-of-the-art knowledge in new, fast and productive spot-welding technology and innovative cold-formed steel-concrete composite solutions. The solution proposes a new construction method as a combination of built- up cold-formed steel members and cast-in-place concrete slab. The proposed floor system offers key benefits in terms of a high degree of prefabrication, reusability and long spanning capability.

Export citation and abstract BibTeX RIS

2. Realised activities 1st year

- D16. 1st Workshop organised (O1 to O2)

3. Realised activities 2nd year

2nd Project Period	
Results to be achieved	RG member
D1. Presentation of project on the web site (O1 to O6) – continuous job...	IL, AR
D2. 2nd and 3rd Research group coordination meeting (O1 to O6) - 2nd Jully 3rd Today☺	All
D3. Training for one group member Introduction to Abaqus/Standard and Abaqus/Explicit (O2 to O5) – finnished	AR
D4. Training for one group member Abaqus/Explicit: Advanced Topics (O2 to O5) – finnished	AR or VŽ
D5. Training for one group member experimental deformation analysis (O2, O3) – finnished	AR or MB
D6. Technical report with test results on materials- 160 tests, see Application form (O2) – we are working on it	IL, AR, MB, IĆ, VŽ
D7. Technical report with test results on spot welded connections - 330 tests, see Application form (O2) – we are working on it	IL, AR, MB, IĆ, VŽ
D8. Technical report with results for tested types of shear connections - 30 tests, see Application form (O2) – we are working on it	IL, AR, MB, IĆ, VŽ
D9. Technical report with interpretation of results for tested types of shear connections - 30 tests, see Application form (O2) – we are working on it	IL, AR, MB, IĆ, VŽ
D10. Fabrication of full-scale steel specimens – 4 (3) specimens, see Application form (O3)– finnished	IL, AR, MB, IĆ, VŽ
D11. Fabrication of full-scale composite specimens – 4 (3) specimens, see Application form (O3) – we are working on it	IL, AR, MB, IĆ, VŽ
D12. Presentation of one or two papers (SDSS 2022) (O2) - finnished	AR, IĆ
D13. 2nd Workshop organised (O1 to O2) – End of 2022 (15th of December 2022)	All

3. Realised activities 2nd year

- D1. Presentation of project on the web site (O1 to O6)

2022 06 | 21 |

Edited: 2022-06-21 at 11:25
Author: Ivan Lukačević

Presentation of the LWT-FLOOR project and recent project activities the International scientific and technical conference «Modern structures of metal and wood»

A. Rajić presented the report "Innovative lightweight composite floor system – built-up cold-formed steel-concrete" at the International scientific and technical conference «Modern structures of metal and wood», Odesa, Ukraine, which has been organised online from 9–11 June 2022. The report can be found at the following link: https://odabamdipk.wixsite.com/sbornik/arhiveconf?lang=en

The recorded presentations from the conference can be found at the following link: https://odabamdipk.wixsite.com/sbornik/conferencess?lang=en

2022 06 | 13 |

Edited: 2022-06-21 at 11:06
Author: Ivan Lukačević

Push tests of innovative shear connection

Master students of the course Composite Structures (2nd year of graduate master study) on Wednesday, June 8, 2022, had the opportunity to attend a push-out laboratory test of innovative shear connection in the Laboratory for Structural Testing at the University of Zagreb, Faculty of Civile Engineering.

Before testing in the laboratory, the HRZZ project LWT-FLOOR is presented to students.

More information can be found here.

2022 02 | 12 |

Edited: 2022-02-12 at 16:20
Author: Ivan Lukačević

New paper related to LWT-FLOOR project has been published!

Lukačević, Ivan; Ćurković, Ivan; Rajić, Andrea; Bartolac, Marko **Lightweight Composite Floor System—Cold-Formed Steel and Concrete—LWT-FLOOR Project** // *Buildings*. 12, (2022) no. 2: 209; https://doi.org/10.3390/buildings12020209

2022 10 | 04 |

Author: Andrea Rajić

The International Colloquium on Stability and Ductility of Steel Structures

Two new research papers have been presented at the International Colloquium on Stability and Ductility of Steel Structures (SDSS 2022) held at the University of Aveiro, Portugal, on the 14-16 of September 2022. The paper "Numerical Investigation of Shear Connection in Cold-formed Steel-concrete Composite Beam" coauthored by Ivan Ćurković, Ivan Lukačević, Vlaho Žuvelek, Andrea Rajić has been presented by Assistant Professor Ivan Ćurković (https://onlinelibrary.wiley.com/doi/10.1002/cepa.1827). The paper "Parametric Finite Element Analyses of Lightweight Cold-formed Steel-concrete Composite Floor Beams" coauthored by Ivan Lukačević, Ivan Ćurković, Andrea Rajić, Vlaho Žuvelek has been presented by Research Assistant Andrea Rajić (https://onlinelibrary.wiley.com/doi/10.1002/cepa.1826).

2022 09 | 09 |

Author: Andrea Rajić

8th DOCTORAL SYMPOSIUM IN CIVIL ENGINEERING

A. Rajić presented the paper "**Analyses of LWT-FLOOR system bending resistance**" at the 8th Doctoral Syposium in Civil Enginnering which has been organised from 5-6 September 2022 at the Faculty if Civil Engineering, University of Zagreb, Croatia.

The symposium program can be found at the following link: https://master.grad.hr/phd-simpozij/2022/Program_Simpozij_2022-EN.pdf

2022 09 | 09 |

Edited: 2022-09-09 at 08:34
Author: Andrea Rajić

8th DOCTORAL SYPOSIUM IN CIVIL ENGINEERING

V. Žuvelek presented the paper **"Numerical study of shear connection in cold-formed steel-concrete composite beam"** at the 8th Doctoral Syposium in Civil Enginnering which has been organised from 5-6 September 2022 at the Faculty if Civil Enginnering, University of Zagreb, Croatia.

The symposium program can be found at the following link: https://master.grad.hr/phd-simpozij/2022/Program_Simpozij_2022-EN.pdf

2022 10 | 28 |

Author: Ivan Lukačević

Best Student Presentation Award at CFSRC 2022 Colloquium

PhD student and Research Assistant Andrea Rajić received an award for best student presentation at CFSRC 2022 Colloquium for the presentation of the paper "Numerical study of cold-formed steel-concrete composite floor system with demountable shear connectors". More info can be found here. Congratulations Andrea!!!!

2022 10 | 28 |

Edited: 2022-10-28 at 13:32
Author: Ivan Lukačević

Cold-Formed Steel Research Consortium Colloquium 2022 (CFSRC Colloquium 2022)

Three new research papers have been presented at the Cold-Formed Steel Research Consortium Colloquium 2022 (CFSRC Colloquium 2022) organised online at Johns Hopkins University by Thin-Walled Structure Group, Baltimore, USA, on the 17-19 of October 2022. The paper "Numerical study of cold-formed steel-concrete composite floor system with demountable shear connectors", coauthored by Andrea Rajić, Ivan Lukačević, Ivan Ćurković and Vlaho Žuvelek has been presented by Research Assistant Andrea Rajić (https://jscholarship.library.jhu.edu/handle/1774.2/67728). The paper "Numerical study of the behavior of the bolted shear connection in cold-formed steel-concrete composite beam", coauthored by Vlaho Žuvelek, Ivan Ćurković, Ivan Lukačević and Andrea Rajić, has been presented by Research Assistant Vlaho Žuvelek (https://jscholarship.library.jhu.edu/handle/1774.2/67727). The paper "Numerical parametric study on corrugated web built-up beams with pinned end supports", coauthored by Ivan Lukačević and Viorel Ungureanu, has been presented by Assistant Professor Ivan Lukačević (https://jscholarship.library.jhu.edu/handle/1774.2/67697).

2022 10 | 04 |

Edited: 2022-10-04 at 15:50
Author: Andrea Rajić

Presentation of papers at 9th gathering of young researchers in the field of construction and related technical sciences called COMMON FOUNDATIONS 2022

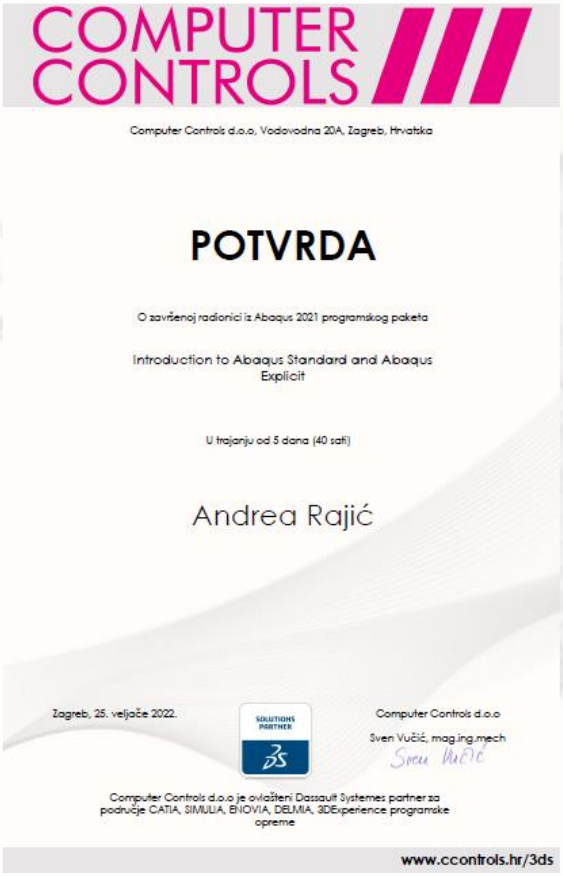
V. Žuvelek and A. Rajić presented their papers at the 9th gathering of young researchers in the field of construction and related technical sciences called COMMON FOUNDATIONS 2022 which has been organised from 28-30 September 2022 in Osijek, Croatia.

3. Realised activities 2nd year

- D2. 2nd and 3rd Research group coordination meeting (O1 to O6)

3. Realised activities 2nd year

- D3. Training for one group member Introduction to Abaqus/Standard and Abaqus/Explicit (O2 to O5)



COMPUTER CONTROLS

Computer Controls d.o.o, Vodovodna 20A, Zagreb, Hrvatska

POTVRDA

O završenoj radionici iz Abaqus 2021 programskog paketa

Introduction to Abaqus Standard and Abaqus Explicit

U trajanju od 5 dana (40 sati)

Andrea Rajić

Zagreb, 25. veljače 2022.

Computer Controls d.o.o

Sven Vučić, mag.ing.mech

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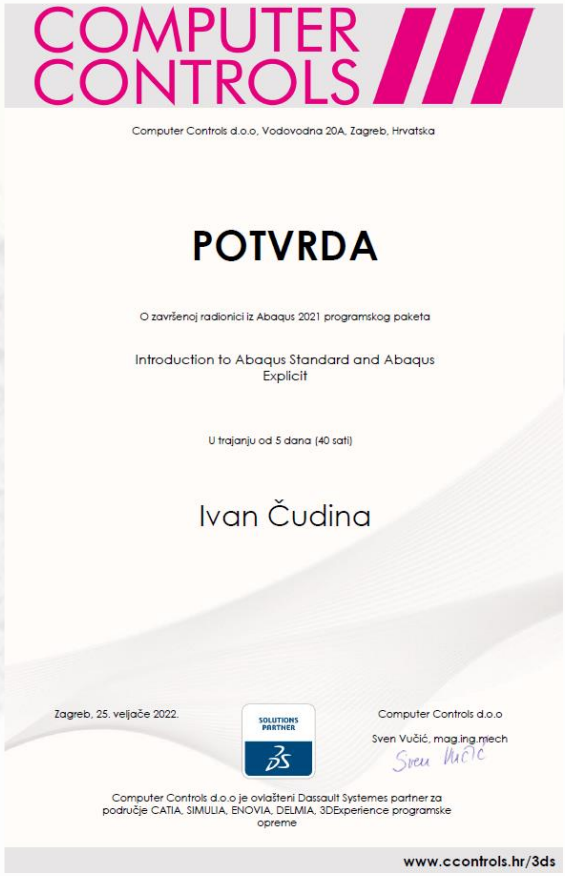

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3. Realised activities 2nd year

- D4. Training for one group member Abaqus/Explicit: Advanced Topics (O2 to O5)

3. Realised activities 2nd year

- D6. Technical report with test results on materials- 160 tests, see Application form (O2)
- D7. Technical report with test results on spot welded connections - 330 tests, see Application form (O2)
- D8. Technical report with results for tested types of shear connections - 30 tests, see Application form (O2)
- D9. Technical report with interpretation of results for tested types of shear connections - 30 tests, see Application form (O2)

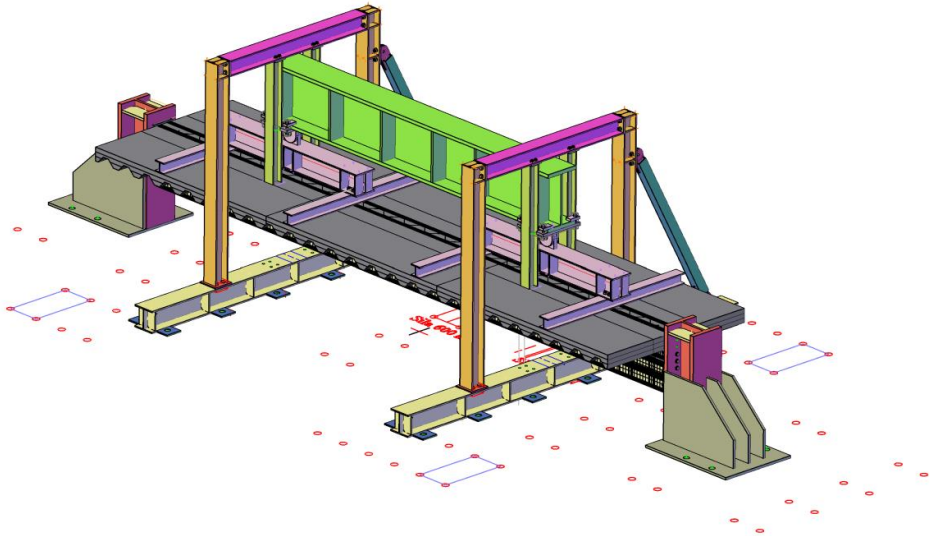
- …we are working on all of these reports…

3. Realised activities 2nd year

- D10. Fabrication of full-scale steel specimens – 4 (3) specimens, see Application form (O3)
- D11. Fabrication of full-scale composite specimens – 4 (3) specimens, see Application form (O3)

3. Realised activities 2nd year

- D10. Fabrication of full-scale steel specimens – 4 (3) specimens, see Application form (O3)
- D11. Fabrication of full-scale composite specimens – 4 (3) specimens, see Application form (O3)



3. Realised activities 2nd year

- D12. Presentation of one or two papers (SDSS 2022) (O2)

4. Publications

Journal papers:

1. Lukačević, Ivan; Ungureanu, Viorel; Valčić, Anđelo; Ćurković, Ivan: **Numerical study on bending resistance of cold- formed steel back-to-back built-up elements** // CE papers, 4 (2021), 2-4; 487-494 doi:10.1002/cepa.1320 (međunarodna recenzija, članak, znanstveni)
2. Lukačević, Ivan; Ćurković, Ivan; Rajić, Andrea; Čudina, Ivan: **Innovative Lightweight Cold-Formed Steel-Concrete Composite Floor System – LWT-FLOOR project** // IOP conference series. Materials science and engineering, 1203 (2021), 1-10 doi:10.1088/1757-899X/1203/3/032078 (međunarodna recenzija, članak, znanstveni)
3. Lukačević, Ivan; Ćurković, Ivan; Rajić, Andrea; Bartolac, Marko: **Lightweight Composite Floor System—Cold-Formed Steel and Concrete—LWT-FLOOR Project** // *Buildings.* 12, (2022) no. 2: 209; https://doi.org/10.3390/buildings12020209 (međunarodna recenzija, članak, znanstveni)
4. Lukačević, Ivan; Ćurković, Ivan; Rajić, Andrea; Žuvelek, Vlaho: **Parametric Finite Element Analyses of Lightweight Cold-formed Steel-concrete Composite Floor Beams** // *ce/papers,* **5** (2022), 4; 836-846 doi:10.1002/cepa.1826 (međunarodna recenzija, članak, znanstveni)
5. Ćurković, Ivan; Lukačević, Ivan; Žuvelek, Vlaho; Rajić, Andrea: **Numerical Investigation of Shear Connection in Cold- formed Steel-concrete Composite Beam** // *ce/papers,* **5** (2022), 4; 847-856 doi:10.1002/cepa.1827 (međunarodna recenzija, članak, znanstveni)

4. Publications

Conference Papers:

1. Rajić, Andrea; Lukačević, Ivan: **Behaviour of lightweight built up cold-formed steel concrete composite beam in bending** *// 10th International Conference on Business, Technology and Innovation 2021 - Conference Book of Abstract* / Hajrizi, Edmond (ur.). Pristina: UBT – Higher Education Institution, 2021. str. - (predavanje, međunarodna recenzija, cjeloviti rad (in extenso), znanstveni)
2. Lukačević, Ivan; Ćurković, Ivan; Rajić, Andrea; Čudina, Ivan: **Numerical analysis of lightweight cold-formed steel- concrete composite floor system** *// 3rd International Conference on Lightweight Materials & Engineering Structures LIMAS – 2021 Proceedings* / Das, Purnendu (ur.). Glasgow: ASRANet Ltd, 2021. str. 20-28 (predavanje, međunarodna recenzija, cjeloviti rad (in extenso), znanstveni)
3. Žuvelek Vlaho; Ćurković Ivan: **Numeričko modeliranje posmične veze između čelika i betona kod spregnutih nosača izvedenih od hladno oblikovanih profila** *// 8. Simpozij doktorskog studija građevinarstva Zbornik radova (Proceedings of the 8th Symposium on Doctoral Studies in Civil Engineering)* / Štirmer, Nina (ur.). Zagreb, 2022. str. 97-110 doi:10.5592/CO/PhDSym.2022.08 (ostalo, domaća recenzija, cjeloviti rad (in extenso), znanstveni)
4. Andrea Rajić, Ivan Lukačević: **Analiza otpornosti na savijanje LWT-FLOOR sustava** *// Osmi simpozij doktorskog studija građevinarstva,* Zagreb, Republika Hrvatska, 2022. str. 57-71 doi:10.5592/CO/PhDSym.2022 (predavanje, domaća recenzija, cjeloviti rad (in extenso), znanstveni)
5. Žuvelek, Vlaho; Ćurković, Ivan; Lukačević, Ivan; Rajić, Andrea: **Numerical study of the behavior of the bolted shear connection in cold-formed steel-concrete composite beam** *// Cold-Formed Steel Research Consortium Colloquium 2022 (CFSRC Colloquium 2022),* Baltimore, United States, 2022. ID102, 12 (predavanje, međunarodna recenzija, cjeloviti rad (in extenso), znanstveni)
6. Rajić, Andrea; Lukačević, Ivan; Ćurković, Ivan; Žuvelek, Vlaho: **Numerical study of cold-formed steel-concrete composite floor system with demountable shear connectors** *// Cold-Formed Steel Research Consortium Colloquium 2022 (CFSRC Colloquium 2022),* Baltimore, United States, 2022. ID103, 10 (predavanje, međunarodna recenzija, cjeloviti rad (in extenso), znanstveni)
7. Lukačević, Ivan; Ungureanu, Viorel **Numerical parametric study on corrugated web built- up beams with pinned end supports** *// Cold-Formed Steel Research Consortium Colloquium 2022 (CFSRC Colloquium 2022),* Baltimore, United States, 2022. ID59, 10 (predavanje, međunarodna recenzija, cjeloviti rad (in extenso), znanstveni)

4. Publications

Conference Abstracts:

1. Lukačević, Ivan; Ćurković, Ivan; Rajić, Andrea; Čudina, Ivan: **Innovative Lightweight Cold-Formed Steel-Concrete Composite Floor System – LWT-FLOOR project** // *6th WMCAUS 2021 - 6th World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium - ABSTRACT BOOK* / Yilmaz, Işık ; Marschalko, Marian ; Drusa, Marian (ur.). Prag: World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium, 2021. str. 427-427 (predavanje, međunarodna recenzija, sažetak, znanstveni)
2. Rajić, Andrea; Lukačević, Ivan: **Behaviour of lightweight built up cold-formed steel concrete composite beam in bending** // *10th International Conference on Business, Technology and Innovation 2021 - Conference Book of Abstract* / Hajrizi, Edmond (ur.). Pristina: UBT – Higher Education Institution, 2021. str. 247-247 (predavanje, međunarodna recenzija, sažetak, znanstveni)
3. Rajić, Andrea; Lukačević, Ivan; Ćurković, Ivan; Žuvelek, Vlaho: **Innovative lightweight composite floor system – built-up cold formed steel-concrete** // Modern structures of metal and wood - Book of Abstract Odesa: Ministry of Education and Science of Ukraine; Odesa State Academy of Civil Engineering and Architecture Rzeszów; University of Technology (Poland); University of Rijeka (Croatia), 2022. str. 18-20 (predavanje, međunarodna recenzija, sažetak, znanstveni)

4. Publications

Presentations on Workshops:

1. Lukačević, Ivan: **Opening Session**
2. Lukačević, Ivan: **Presentation of the LWT-FLOOR project**
3. Ungureanu, Daniel Viorel; Both, Ioan: **Corrugated web built-up cold-formed beams**
4. Lukačević, Ivan: **Investigations on spot welded built-up cold-formed steel beams**
5. Rajić, Andrea; Žuvelek, Vlaho: **Numerical analysis of lightweight cold-formed steel-concrete composite floor system**
6. Bartolac, Marko : **Scope of activities of structural testing laboratory at the University of Zagreb - Faculty of Civil Engineering**
7. Rajić, Andrea: **Behaviour of lightweight built up cold-formed steel-concrete composite beam in bending**
8. Lukačević, Ivan: **Numerical study on bending resistance of cold-formed steel back-to-back built-up elements**
9. Ćurković, Ivan: **Steel and composite steel-concrete shear plates**
10. Kralj, Anton; Skejić, Davor: **Loadbearing capacity of LSF walls under fire exposure**

Other:

1. Rajić, Andrea: **Ponašanje laganog spregnutog nosača - sastavljeni hladno oblikovani čelik - beton u savijanju**, 2021. (ostale vrste radova, studentski rad za rektorovu nagradu)
2. Rajić, Andrea: **Primjena lagane spregnute međukatne konstrukcije kod višekatne zgrade**, 2021., diplomski rad, diplomski, Građevinski fakultet, Zagreb

5. Equipment

- Inverter Spot-welding machine

5. Equipment

- Data Aquisition System

5. Equipment

- 2 PCs

5. Equipment

- Force measuring sensors

- Linear Variable Differential Transformers

5. Equipment

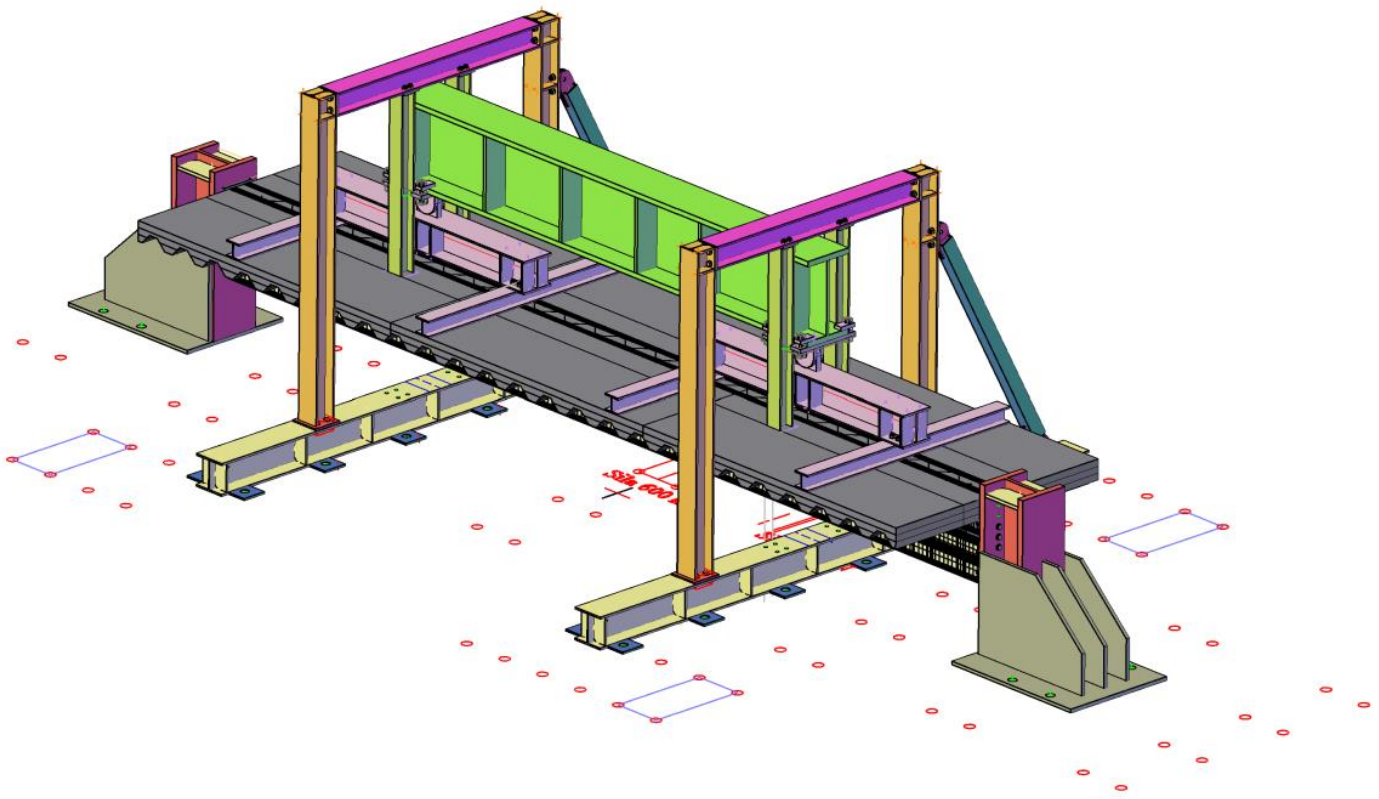
- Camera

5. Equipment

- 3D scanner

5. Equipment

- Test rig for Zwick&Roell servo hidraulic machine



5. Equipment

- Workstation Fujitsu CELSIUS R970B

Opening Session - presentation of the LWT FLOOR project and overview of the realised activities

Ivan Lukačević